

NOTES.

THE jubilee of the coal-tar industry will be celebrated in America next month, and Sir William Perkin, F.R.S., the discoverer of "mauve," will leave England on September 22 for New York to receive a public tribute from Americans for the services he has rendered to chemical industry and science. At a public meeting held last May, the committee submitted the following programme:—(1) To invite Sir (then Dr.) W. H. Perkin to be present at the American celebration as the guest of the Americans, the date of the event to be October 6 (subject to the approval of Sir William Perkin), and to consist of a banquet and symposium on the coal-tar industry; (2) the presentation to Sir William Perkin of a personal token; (3) the foundation of a Perkin medal, to be awarded annually to an American chemist for distinguished work in applied chemistry; (4) the establishment of a nucleus of a fund at the Chemists' Club in New York City for a reference and circulating library covering the entire field of theoretical and applied chemistry, which is to be in charge of a salaried librarian, and to contain duplicate sets, one of them to be used for circulation among American chemists. A sum of at least 50,000 dollars was estimated as necessary to place the library on a permanent basis. It is also expected that a substantial contribution will be made to the international fund in London. The American committee includes the names of about 150 of the leading scientific and public men in the United States.

WE notice with deep regret the announcement that Prof. Ludwig Boltzmann, professor of theoretical physics in the University of Vienna, died by his own hand at Duino a few days ago.

ON October 1 Sir George Watt, C.I.E., reporter on economic products to the Indian Government, will deliver the opening address of the session at the School of Pharmacy of the Pharmaceutical Society of Great Britain, and the president of the society will present the Pereira medal.

A REUTER message from Tiflis reports that the township of Kwareli, covering an area of five kilometres in the district of Telaff (Caucasus), has been almost entirely destroyed by an avalanche of mud, sand, and stones from the neighbouring mountain-side. Disasters of this nature are of frequent occurrence in the Caucasian valleys.

A MEETING of the German Astronomical Society opened yesterday morning at Jena, and will continue in session until Saturday. In addition to scientific business, visits will be paid to the optical works of Zeiss and to Schott's glassworks. The meeting of the German Association of Naturalists and Physicians will open at Stuttgart on September 16, so that members of the Astronomical Society who propose to attend it will be able to leave Jena in time to do so.

THE Government of Cape Colony has placed a sum upon the Supplementary Estimates toward the expenses incurred in carrying out investigations upon defects in ostrich feathers, under the direction of Prof. J. E. Duerden, of Rhodes University College, Grahamstown. A letter upon the subject appeared in NATURE of May 17 (p. 55).

THE famous engineering firm of Friedrich Krupp, Ltd., of Essen, is contemplating the erection of a technico-physical laboratory at a probable cost of 2,500,000 marks.

PROF. MAX TOEPLER, the inventor of the mercury pump bearing his name, and professor of physics at the Technical High School, Dresden, celebrated his seventieth birthday on September 7.

THE Berlin municipal laboratories for the analysis of foodstuffs will be ready shortly. On the first floor will be the chemical and microscopical sections, in a hall on the ground floor there will be a collection room for tests and samples, while above the chemical and microscopical sections there will be rooms for bacteriology, electrolytic work, the hydrology bureau, and the library, with reading room. A special outbuilding will be used for animal examinations.

PROF. WILHELM HITTORF will shortly celebrate his golden "Universitäts-Jubiläum" in Münster. In 1848 he was a privatdozent at the then Münster Akademie; from 1852-6, extraordinary professor of physics and chemistry; and from 1856-1875, ordinary professor of both subjects, but since the latter date he has only retained the professorship of physics. His professorial colleagues are presenting him with a marble bust of himself, by Herr Rüller, of Münster. Prof. Hittorf has presented 25,000 marks to the science faculty for the purpose of furthering scientific work.

AN international congress for the study of the Polar regions was opened on September 7 at the Palais des Académies, Brussels, under the presidency of M. Beernaert, Ministre d'Etat. The *Times* correspondent states that among those present were Dr. Nordenskjöld, M. Arctowski, M. de Gerlache, Captain Scott, and Prince Buonaparte. Baron de Favereau, the Belgian Minister for Foreign Affairs, welcomed the delegates. A draft scheme for the formation of an international Polar commission was adopted on Tuesday. The primary aims of the commission are to bring about closer relations among Polar explorers, to coordinate scientific observations, and to assist Polar enterprise, without, however, organising expeditions on its own account. It was resolved to submit this scheme to the approval of the respective Governments. At the final meeting M. Charcot announced his intention of organising a fresh expedition to the South Pole, and Dr. Nordenskjöld expressed a hope that Belgians would cooperate with the French in this undertaking.

THE committee of the Quekett Microscopical Club has arranged for a series of demonstrations at 20 Hanover Square, W., on "The Practical Use of the Microscope and its Accessories," to be given from 7 p.m. to 8 p.m. on the third Friday in each month during the ensuing session. The first will be on November 16, when Mr. H. F. Angus will deal with axial substage illumination, including the use of the plane and concave mirrors, substage condensers, and methods of centring the illuminant and of obtaining critical illumination. At other demonstrations, the order of which is not yet finally settled, the following subjects, among others, will be considered:—substage non-axial illumination, including oblique and dark ground illumination; the use of the micropolariscope; various methods of illuminating opaque objects; the testing and comparison of objectives; and the employment of micrometers and finders. These demonstrations will be in addition to the "Gossip" meetings of the club, which are held on the first Friday, and to the ordinary meetings, held also on the third Friday of the month at 8 p.m. Further particulars may be obtained from the hon. sec., Mr. A. Earland, 31 Denmark Street, Watford, Herts.

IT is well known that during the last few years the study of protozoa has made remarkable advances. It has been shown that numerous protozoa play an important rôle in human and animal diseases, and the unravelling of their life-histories has been attempted by many workers with enthusiasm and success. Among these workers no one

has done more than Fritz Schaudinn, whose premature death this summer has been lamented by the whole world of biologists. He not only made many discoveries of importance, he opened up new lines of investigation which are full of promise. His work has made it safe to prophesy that protozoology will surely develop into a department not less important than bacteriology. Doubtless influenced by his master, F. E. Schulze, Fritz Schaudinn began about ten years ago to study protozoa, and he soon attained the rank of a discoverer. His researches on multiple nuclear division, the central corpuscle of heliozoa, and the dimorphism of foraminifera (at the same time elucidated by Mr. J. J. Lister) were of much interest, but it was his working out (along with Siedlecki) of the life-history of *Coccidia* (1897) that first indicated his characteristic ability. During the last few years he published memoir after memoir on the life-histories of parasitic protozoa, such as *Trypanosoma* and *Spirochaete*, and made excursions into the field of bacteriology, e.g. in the discovery of the spirillum of syphilis. He founded the *Archiv für Protistenkunde*, now in its seventh volume, and he had time to indulge in some purely zoological work, e.g. the study of Tardigrada. He was cut off in June last in the midst of his labours, at the early age of thirty-five—an irreparable loss to science. Nor does the sadness end here, for Schaudinn has left a widow and young family very inadequately provided for. As he has left the world his debtor, it is to be hoped that success will attend a proposed international memorial, in which many prominent biologists and physicians in this country have already interested themselves. Subscriptions should be sent to the treasurer, Mr. Adam Sedgwick, F.R.S., New Museums, Cambridge.

THE May issue of the Proceedings of the Academy of Natural Sciences of Philadelphia contains a paper by Mr. J. A. G. Rehn on non-saltatorial orthopterous insects (inclusive of Mantidae and Phasmidae) from British Guiana, in which several new species are named and described, and a second, by the same author, on five new species of Orthoptera from Tonkin.

THE whole of the second part of vol. lxxxiv. of the *Zeitschrift für wissenschaftliche Zoologie* is taken up by a paper of 155 pages on the terminal nerve apparatus in the mouth-parts of birds, and the general mode of nerve termination in vertebrates as a whole. The author, Dr. E. Botezat, concludes that the terminations of peripheral nerves conform to a common fundamental plan, and have a definite structure of their own, which is unlike that of the nerve terminations of the higher sensory organs.

THE habits and reactions of the American pond-snail *Lymnaeus elodes* (probably only a local phase of the European *L. palustris*) form the subject of No. 6 of Cold Spring Harbour Monographs, the author in this instance being Mr. H. E. Walter. Although the creature ordinarily breathes by coming at intervals to the surface and filling its lung-chamber with air, in exceptional circumstances it is able to breathe without rising to the surface at all, the lung-chamber being then filled with water. This secondary adaptation is, however, at once relinquished when the inducing circumstances disappear.

SCIENCE Bulletin No. 8 (vol. i.) of the Brooklyn Institute of Arts and Sciences contains notes on birds from Trinidad, by Mr. G. K. Cherrie; descriptions of various North American moths and their larvae, by Mr. H. G. Dyar; and a list of geometrid moths from Utah, Texas, and Arizona, with descriptions of new species, by Mr.

R. T. Pearsall. A number of star-fishes from the Pacific coast of North America are described as new by Mr. W. K. Fisher in vol. viii., pp. 111-139, of the Proceedings of the Washington Academy of Sciences. A detailed monograph, with illustrations, is promised later.

THE contents of the September number of the *Entomologists' Monthly Magazine* include a continuation of the nomenclature of the Microlepidoptera by Lord Walsingham and Mr. J. H. Durrant, a further instalment of Dr. J. H. Wood's synopsis of the British flies of the genus *Phora*, and a paper by Mr. N. H. Joy on beetles infesting the nests of birds and mammals. Having taken the beetle *Cholera colonoides*, as well as other supposed rare species, in birds' nests last year, the author of the paper just mentioned came to the conclusion that if such "stations" were carefully searched the rarity of the beetles in question would prove a myth. Put to the test of experiment, the theory has turned out to be true, while the nests of the smaller mammals have proved an even more productive source of interesting Coleoptera.

THE fourth part of vol. xxxv. of Gegenbaur's *Morphologisches Jahrbuch* opens with a eulogy of the founder delivered by Prof. C. Seffner at the unveiling at Heidelberg on May 12 of a bust of the great anatomist. A photograph of the bust accompanies this brief résumé of Carl Gegenbaur's life and work. A large part of the rest of the issue is occupied by a long and elaborate description and discussion, by Mr. H. Braus, of Heidelberg, on the fore-limb and operculum of the larva of the frog *Bombinator*. Attention is directed to a certain correlation between the fore-limb and the operculum, more especially with regard to the perforation in the latter. Dr. Charlotte Müller discusses the development of the human thoracic cavity, while Messrs. G. Kolossoff and E. Paukul formulate a mathematical theory to explain the papillary ridges and grooves on the palm and sole of the human hand and foot.

DURING last year's visit of the British Association to South Africa, Mr. C. F. Rousselet occupied himself, so far as circumstances would permit, with collecting the rotiferous animalcules of the country. Despite very unfavourable conditions for collecting, the result of his labours has been enormously to increase the South African list, especially if Natal (where more work on the group had been done than elsewhere) be excluded. Mr. Rousselet's paper on this fauna is published, with illustrations, in the August number of the Journal of the Royal Microscopical Society. At the conclusion of his paper the author comments on the extraordinarily wide geographical distribution of many of these minute organisms. "The best explanation is that the Rotifera, in addition to thin-shelled summer eggs which hatch at once, produce resting eggs with thick tough shells capable of withstanding any amount of desiccation, and which may be wafted up with the dust of dried-up pools, and carried very long distances by the wind and air-currents, and thus scattered over the whole surface of the earth, and then come to life and produce their kind."

AN account in *Naturwissenschaftliche Wochenschrift* (July 8) of the Sigillariæ, by Dr. W. Koehne, indicates how the impressions or casts, known as *incrustations*, of these fossil Lycopods are produced, and contrasts them with petrifications in which cell structure is preserved.

FOR several years the application of electricity to agriculture has been increasing in Germany, where the owners of large farms have been brought to see the advantages

of this system. Some of the large electrical manufacturing firms have entered actively into the development and supply of machinery in this new field, and some striking illustrations are given by Mr. Franz Koester in the *Engineering Magazine* (vol. xxxi., No. 5) showing views taken on farms where electricity is used exclusively for motive power.

In the *Revue de Métallurgie* (vol. iii., No. 2), issued as a supplement to the *Bulletin de la Société d'Encouragement*, Mr. Guillery describes a new method of determining the elastic limit of metals by recording the variations in the electric resistance of the test-piece as the load in the testing machine is increased. The method is not yet fully developed, but the results of a number of tests made by the author at Denain, and the simplicity of the apparatus used, render it worthy of careful consideration.

In the case of an engine using saturated steam, the PV diagram can be converted into the $\theta\phi$ equivalent either by a somewhat tedious calculative method or by Boulvin's graphic method. The latter necessitates the preliminary re-plotting of the diagrams to the pressure and volume scales before the graphic transference can be carried out. A modification of this method has been devised by Mr. W. J. Goudie, and is described in the *Engineering Review* (vol. xv., No. 2). A direct transference from the actual indicator diagrams is effected, and the saving in time and labour should render the method useful to engineers who make frequent use of the temperature-entropy chart.

THE September issue of the new bi-monthly journal *Concrete* contains admirably illustrated articles on the micro-structure of Portland cement by Dr. C. H. Desch, and on reinforced concrete at the Milan Exhibition by Mr. F. R. Farrow. This new addition to technical periodical literature should prove a valuable source of information to all workers in concrete and cement. The details of the new uses to which concrete and reinforced concrete are put are very remarkable. The use of reinforced concrete as a substitute for timber in exposed positions is rapidly increasing. Railway sleepers, telegraph posts, and fence posts are being tried, and efforts are being made to prove that reinforced concrete is an excellent substitute for brickwork where structures of great height are required.

WE have received from the Geological Survey of Canada three reports of special economic interest. The report (No. 923) on the Chibougamau mining region in the northern part of the province of Quebec, by Mr. A. P. Low, records the discovery of an area of serpentine rocks containing asbestos of excellent quality, together with the finding of a large vein of gold-bearing quartz and numerous indications of copper ores. Mr. R. W. Brock submits a preliminary report (No. 939) on the Rossland mining district, British Columbia. A more complete report is in preparation. Mr. C. W. Willmott's monograph on the mineral pigments of Canada (No. 913) contains the results of an elaborate series of experiments with the various pigments that can be derived from minerals, ochres, and clays either in their crude state or by burning. They show that in almost every colour a paint of good body and permanent tone may be produced from Canadian material.

An account of Sinhalese earthenware is given by Mr. A. K. Coomaraswamy in vol. iv., part xiii., of *Spolia Zeylanica*. Elaborate types are not found, and no glaze is used; the sides of the pots are made on the wheel, which is turned by a boy; some hours or days later, putting a smooth stone inside, the potter fashions the lower part of the sides so as to form the bottom—a most unusual procedure. In addition to domestic and ritual pottery, the

author deals with roof-tiles, some of which, for use on the eaves, are decorated. Earthen vessels are also decorated with incised, stamped, or slip-painted designs, and the most effective of these styles is stamping, though some of the incised designs produce a very Greek-like effect. The paper is illustrated by three collotypes and numerous blocks in the text.

THE summary of the weather for the week ended September 8, issued by the Meteorological Office, shows that the highest shade temperature in the recent hot spell was 96°, at Bawtry, in the Midland counties, registered on September 2. The rains which occurred with the change to cooler weather were very heavy in places, although by no means general. In parts of London the fall on the night of September 4-5 amounted to an inch, and to 1.68 inches at Ventnor; while at Glencarron the measurement on September 5 was 1.98 inches, and at Fort William 1.87 inches. In most parts of England the weather has been exceptionally dry for nearly three weeks. At Spurn Head and Bath no rain has fallen since August 24, and at Shields none has fallen since August 26, while at many places, widely separated, the measurement since about August 25 amounts only to a few hundredths of an inch. The general type of weather which has characterised the summer is still continuing. Bright sunshine is unusually prevalent, with very dry conditions, but the temperature has fallen, although the days at present are still mostly warm. At Greenwich, the exposed thermometer on the grass registered 28° on the morning of September 11, and the ground in the suburbs of London was coated with hoar-frost.

WE have received from the meteorological reporter to the Government of India a memorandum on the weather conditions during June and July, with an estimate of the monsoon rainfall during August and September, 1906. It is stated that the total rainfall of June and July was distributed with about the usual uniformity over the greater part of India; the only areas of large defect were Sind (52 per cent.), the Punjab (27 per cent.), and Bengal (21 per cent.). In both these months there was, on the average of the whole country, a defect of 3 per cent. in the rainfall. In forming a forecast for August and September, the conditions in various parts of the world are stated; of these, the most powerful factor is thought to be the pressure in the southern Indian Ocean. An illustration of this is given by a table containing all years since 1875 in which pressure at Mauritius in July differed from the normal by more than 0.024 inch, together with the rainfall of Bombay and bay currents in the ensuing August and September; it shows that there is a marked tendency for high pressure to be followed by deficient rainfall, and *vice versa*. At Mauritius, pressure this year was below the normal in June by 0.045 inch, and in July by 0.020 inch, a fact which is, therefore, decidedly favourable; but so many factors come into play, e.g. temperature, the distribution of snowfall in the mountain regions north and west of India, and probably pressure over South America, that Dr. Walker is unable to say more than that there appears, on the whole, to be no reason for anticipating either a large excess or a large defect in the rainfall of August or September.

THE Royal Society of Canada, which was founded by the Duke of Argyll in 1881, celebrated its semi-jubilee this summer. The president, Prof. Alexander Johnson, in his address at the annual meeting, described the conditions which led to the society's inception and the development of its activities. A large portion of the address was appro-

privately devoted to considering the different conceptions which have been held with regard to matter, culminating in the theory of atomic disintegration, which had its birth in Montreal in 1902.

At the end of an interesting and instructive paper in a recent number of the *Chemiker Zeitung* (No. 61, p. 742) on the chemical composition of the eruptive products of volcanic actions, and more especially that of Vesuvius in April of this year, Prof. Julius Stoklasa, of Prague, directs attention to the meagre primitive equipment of the Royal Seismological Observatory situated in the immediate neighbourhood of Vesuvius, where on April 3 Prof. Matteucci observed the first subterranean signs of this year's eruption, and which Prof. Stoklasa visited in May last. In this article Prof. Stoklasa throws out the suggestion that the observatory should be re-modelled and made an international experimental station with geophysical and chemical laboratories, similar, in fact, to the International Biological Station at Naples, which is being provided with extensions to its physiological and chemical laboratories for the purpose of more thoroughly investigating marine fauna and flora.

In 1903, from the occurrence of a number of lines common to the spectra of krypton and xenon, Dr. Baly inferred the existence of a new element present as an impurity in those gases. From a study of the spectra of different fractions of the most easily condensable portion of the inert gases of the atmosphere, Dr. Rudolf Schmidt now concludes in the *Verhandlungen* of the German Physical Society (vol. viii., No. 14) that xenon is not a true element, but a mixture, possibly of several gases. The ultra-violet spectrum between $\lambda=3450$ and $\lambda=2800$ of one fraction of the gas was found to contain only about forty lines, the greater part corresponding with those ascribed to xenon; several, however, were new. Within the same range Baly measured about 500 lines, and the difference in the two numbers might at first sight appear to be due to insufficient illumination in the one case. This view is contradicted, however, by the fact that some of the lines which appeared feeblest in Baly's spectra showed the greatest intensity in the case of this particular fraction, whilst all the brightest lines of "xenon" were missing. The only explanation appears to be that the gas hitherto called xenon is a more or less complex mixture.

THE Country Press, 19 Ball Street, Kensington, W., has added to its series of nature-study picture postcards twelve cards, which may be obtained for one shilling, depicting twenty-three species of British grasses. The popular and botanical names are given in each case, together with the time of flowering and a magnified representation of the fructification.

THE Nagari-pracharina Sabha, of Benares, has published a "Hindi Scientific Glossary," containing the terms employed in most of the sciences, except biology and geology. The glossary has been edited by Mr. Syam Sundar Das, honorary secretary of the Nagari-pracharina Sabha, with the cooperation and assistance of an editorial committee. The glossary is divided into seven parts, dealing respectively with terms of geography, astronomy, political economy, chemistry, mathematics, physics, and philosophy. Preference has been given to common and current Hindi terms. In the absence of appropriate Hindi equivalents, certain appropriate terms existing in some of the prevalent vernaculars have been used. When these have failed, the existing Sanskrit terms have been taken or the English terms employed.

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OUR ASTRONOMICAL COLUMN.

HOLMES'S COMET (1906f).—According to Prof. Wolf's telegram announcing its re-discovery, as published in No. 4118 of the *Astronomische Nachrichten*, the photographic magnitude of Holmes's comet on August 28 was 15.5. As the comet passed through perihelion on about March 14 it is not likely to become a brilliant object during the present apparition. The corrections to Dr. Zwiers's ephemeris are $-6s.$ and $-2'$.

FINLAY'S COMET (1906d).—A continuation from M. L. Schulhof's ephemeris for Finlay's comet is given below:—

1906	α (app.) h. m.	δ (app.)	1906	α (app.) h. m.	δ (app.)
Sept. 15 ...	6 40 ...	+19 19	Sept. 23 ...	7 7 ...	+20 3
17 ...	6 47 ...	+19 33	25 ...	7 13 ...	+20 11
19 ...	6 54 ...	+19 44	27 ...	7 19 ...	+20 17
21 ...	7 1 ...	+19 54	29 ...	7 24 ...	+20 22

The comet will pass about 1° south of ζ Geminorum on September 20, and about 2° south of δ Geminorum on September 25.

COMET 1906e (KOPFF).—A further extract from Herr M. Ebell's ephemeris for Kopff's comet (1906e) is given below:—

Ephemeris (12h. M.T. Berlin).

1906	α (true) h. m.	δ (true)	Brightness
Sept. 16 ...	22 33 ...	+8 28 ...	0.54
18 ...	22 32 ...	+8 16 ...	
20 ...	22 31 ...	+8 4 ...	0.48
22 ...	22 31 ...	+7 52 ...	
24 ...	22 30 ...	+7 40 ...	0.43
26 ...	22 29 ...	+7 28 ...	
28 ...	22 29 ...	+7 16 ...	0.38

Herr Ebell calculated two sets of elements, obtaining October 16, 1905, and May 14, 1906, as the respective times of perihelion passage, but, as seen from the residuals (observed-calculated), there is considerable uncertainty attaching to the calculated path.

Two other sets of elements, communicated by Prof. E. C. Pickering, give April 12, 1907, and December 7, 1906, respectively, as the time of perihelion, and the resultant ephemerides show the comet's brightness to be increasing at the present time. Observing at Hamburg on August 23, Dr. Graff found that the comet had a coma of 0.5 diameter, with a nucleus of magnitude 12.5, the magnitude of the whole being 11.5 (*Astronomische Nachrichten*, No. 4118).

THE PLANET MERCURY.—Continuing his articles in the *Observatory* (No. 374) on planets and planetary observations, Mr. Denning this month discusses the best times and methods of observing Mercury. Dealing with the legendary lament of Copernicus that he had never seen this planet, Mr. Denning expresses his doubts as to its authenticity. The late Rev. S. J. Johnson saw Mercury as an evening star about 150 times during the years 1858–1905, whilst Mr. Denning has seen it some 130 times since February, 1868, and suggests that, if looked for regularly, this elusive object may probably be seen on about fifteen occasions per annum in the English climate. In the spring, Mercury should be looked for some days before the maximum elongation, but in the autumn apparitions some days after the elongation. After discussing the observing conditions, Mr. Denning proceeds to describe the surface markings as seen—with great difficulty—on the telescopic image of Mercury since the time of Schröter.

OBSERVATIONS OF SATELLITES.—Prof. Barnard observed the sixth satellite of Jupiter nine times, on February 27 and March 20, during last winter, and found it quite an easy object, under fair weather conditions, with the 40-inch refractor of the Yerkes Observatory.

On February 27 the magnitude was 14.0, and on March 20, when Jupiter was lower down at the time of observation, it was estimated as 14.5. The positions determined from these observations are recorded in No. 4112 of the *Astronomische Nachrichten*.

In No. 4116 of the same journal the same observer